Fetal hemodynamic parameters in monochorionic diamniotic twin pregnancies complicated with twin to twin transfusion syndrome treated by laser photocoagulation

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Objective
To determine the prognostic value of fetal echocardiography for twin-twin transfusion syndrome (TTTS) using the CHOP (Children’s Hospital of Philadelphia) cardiovascular score in correlation with the Quintero staging. To evaluate whether hemodynamic changes, pre and post laser photocoagulation, predict the neonatal survival.

Methods
Hemodynamic parameters of 90 pregnancies with TTTS were collected pre and post laser photoagulation. The cardiac function parameters were compared to 90 uncomplicated monochorionic diamniotic twin pregnancies.

Results
Between 2006 and 2013, 90 laser photocoagulations were performed. Quintero staging was divided between stage 1 (11%), 2 (39%), 3 (49%) and 4 (1%). Fetal echocardiography was available in 82 cases but pre and post laser intervention in only 69 cases. Neonatal survival rates were 19%, 22% and 59% for zero, one or two twins respectively. At least one twin was delivered alive in 81% of the pregnancies. The mean gestational age at surgery was 20 weeks (range 15-25). The mean age at birth in cases with at least one live birth was 32 weeks (range 24-38). The following factors were not associated with neonatal survival: placental location, Quintero staging, gestational age at diagnosis, amnioreduction volume. The preoperative myocardial performance index (MPI) was higher in the recipient than in the donor twin (0.58 vs 0.37, p<0.001). In healthy monochorionic twins MPI was 0.43 (right ventricle) and 0.37 (left ventricle), and the CHOP cardiovascular score was 1.8. The mean CHOP score was 4.8 preoperatively and 3.3 postoperatively (p<0.001, paired t test). The CHOP score was not related to neonatal survival.

Conclusion
Our study confirmed a correlation between the Quintero staging and the CHOP cardiovascular score. However, both tests showed no prognostic value in predicting neonatal survival rates. Discrepancies in hemodynamic parameters between TTTS and controls and between donor and recipient twin are evidenced by fetal echocardiography.